CLAIMS

1. A method for temporal inversion of a wave corresponding to at least one initial signal s(t), where t is the time, this initial signal s(t) exhibiting a certain central frequency f0, in which method a temporal inversion signal $\alpha.s(-t)$, where α is a multiplicative coefficient and s(-t) is the temporal inversion of s(t), is determined, **characterized in that** it comprises at least the following steps:

- a first transformation suitable for lowering the central frequency of the signal and for substantially not causing any loss of information with respect to the initial signal is applied to the initial signal s(t), said first transformation producing a first set of transformed signals comprising at least one first transformed signal Ki(t) of lower central frequency than the initial signal, said first set of transformed signals Ki(t) being representative of said initial signal s(t),
- a second transformation producing a second transformed signal K'i(t) substantially of the same central frequency as the first transformed signal is applied to each first transformed signal Ki(t), said second transformation thus producing a second set of transformed signals K'i(t) from the first set of transformed signals Ki(t), said second transformation being chosen so that said second set of transformed signals is representative of the temporal inversion signal s(-t),
- a third transformation which generates the temporal inversion signal $\alpha.s(-t)$ is applied to the second set of transformed signals K'i(t).

2. The method as claimed in claim 1, in which the passband Δf is less than f0.

3. The method as claimed in claim 1 or claim 2, in which the third transformation is a transformation inverse to the first transformation.

4. The method as claimed in claim 3, in which the first transformation is a demodulation suitable for eliminating a carrier signal of frequency f0 so as to extract said first set of transformed signals $Ki(t)$ from the initial signal $s(t)$, and the third transformation is a modulation of a carrier signal of frequency f0 by the signal or signals $K'i(t)$.

5. The method as claimed in claim 4, in which the first transformation is an IQ demodulation producing two first transformed signals $K1(t)=I(t)$ and $K2(t)=Q(t)$ such that $s(t) = I(t)\cos(2\pi.f0.t) + Q(t)\sin(2\pi.f0.t)$, the second transformation transforms the signal $K1(t)$ into $K'1(t)=I(-t)$ and the signal $K2(t)$ into $K'2(t)=-Q(-t)$, and the third transformation is an IQ modulation inverse to said demodulation.

6. The method as claimed in claim 4, in which the first transformation is an amplitude and phase demodulation producing two first transformed signals $K1(t)=A(t)$, and $K2(t)=\varphi(t)$, where $A(t)$ is the amplitude of the signal $s(t)$ and $\varphi(t)$ the phase of the signal $s(t)$, the second transformation transforms the signal $K1(t)$ to $K'1(t)=A(-t)$ and the signal $K2(t)$ to $K'2(t)=-\varphi(-t)$, and the third transformation is a modulation inverse to said demodulation, produing the temporal inversion signal $s(-t)=A(-t)\cos[2\pi.f0.t-\varphi(-t)]$.

7. The method as claimed in any one of claims 1 to 3, in which the first transformation is a subsampling, with a sampling frequency of less than 2f0 but at least equal to $2\Delta f$, producing a single transformed signal $K1(t)$, the second transformation is a temporal inversion transforming the signal $K1(t)$ to $K'1(t)=K1(-$

t), and the third transformation is a filtering of passband substantially equal to Δf and centered on f0, transforming K'1(t) into s(-t).

8. The method as claimed in any one of claims 1 to 3, in which the first transformation is a downward frequency shift, into intermediate band, producing a single first transformed signal K1(t), the second transformation is a temporal inversion transforming the signal K1(t) into K'1(t)=K1(-t), and the third transformation is an upward frequency shift, the inverse of said downward frequency shift.

9 The method as claimed in any one of the preceding claims, in which the first and third transformations are carried out on analog signals, each first transformed signal undergoes a sampling and the second transformation is carried out digitally before converting each second transformed signal into an analog signal.

10. The method as claimed in claim 9, in which the sampling is carried out at a sampling frequency of below f0.

11. The method as claimed in any one of the preceding claims, in which the wave is electromagnetic.

12. The method as claimed in claim 11, in which the central frequency f0 is between 0.7 and 50 GHz.

13. The method as claimed in claim 12, in which the central frequency f0 is between 0.7 and 10 GHz.

14. The method as claimed in any one of claims 1 to 10, in which the wave is chosen from among acoustic waves and elastic waves.